

TRANSACTIONS

OF THE

BRITISH SOCIETY FOR THE
STUDY OF ORTHODONTIA.

MAY AND JUNE, 1908.

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THE DENTAL MANUFACTURING COMPANY LIMITED.

DEMONSTRATION MEETING.

A DEMONSTRATION meeting was held at 11, Chandos Street, W., on Wednesday, May 20th, at 8 p.m. The demonstrations were given as follows :—

Mr. George Northcroft, "Taking Plaster Impressions."

Mr. H. C. Visick, "Making of Spurs."

Mr. J. E. Spiller, "The Jackson Crib."

Mr. C. S. Morris, "A New Pair of Band Forming Pliers."

Mr. J. G. Turner, "An Expansion Plate."

There was a good attendance of members and visitors, who much appreciated the demonstrations which were of an interesting and practical nature.

ORDINARY MEETING.

THE ordinary monthly meeting of the Society was held at the rooms of the Medical Society of London, Chandos Street, on Wednesday, June 17th, 1908, Mr. J. H. BADCOCK, President, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. Wilton Thew signed the Obligation Book, and was formally admitted to membership of the Society.

Mr. Robert May, L.D.S. Eng., and Mr. Walter Pidgeon, L.D.S. Eng., were ballotted for, and duly elected.

Mr. HAROLD CHAPMAN then read his paper, entitled,

“ON THE OCCLUSION OF THE TEMPORARY TEETH AND ITS BEARING ON ANGLE'S CLASS II. CASES.”

IN the realm of orthodontia normal occlusion is a *sine qua non* : but is it not a remarkable fact that the literature of this speciality has been devoted almost exclusively to the occlusion of the permanent dentition ?

Though some few cases of mal-occlusion of the temporary teeth have been reported, little or nothing has been written about their normal occlusion.

The normal occlusion of the permanent dentition is so well known that it will only be necessary to refer to one or two facts concerning the molars. It will be remembered that the third lower molar is usually a large tooth, much larger than its chief antagonist, the third upper molar ; also the other lower molars are mesio-distally greater than the corresponding upper teeth, the difference is less marked however.

But the mesial surface of the first lower molar is situated considerably mesially to the corresponding surface of the first upper molar ; the result of this difference in mesio-distal diameter and in position of the first molars is to bring the distal surfaces of those teeth, which are the terminals, as it were, of the two arches, into the same vertical plane, or even to bring the distal surface of the last lower molar beyond that of the upper (Fig. 1A). In other words, “the greatest efficiency and no waste of material.”

It is the writer's endeavour to show that the same is true of the temporary dentition, although it is succeeded by a greater and more complex masticating apparatus as soon as demanded by the economy of nature for the growing child and then to discuss what effect it will have on the permanent dentition.

Admitting the correlation of the deciduous and permanent dentitions, each, however, considered *per se*, constitutes a unit in itself ; the milk set is not concerned with the successional set and the permanent set is not concerned with its predecessors.

That this fact may be associated with mal-occlusion of the first permanent molars as regards their mesio-distal relationship, the writer believes to be extremely probable, but on the other hand he is unable to offer satisfactory proof which explains by what process in development these teeth ever assume their normal relationship as in the majority of cases they do.

For a few moments consider the occlusion of the temporary teeth ; starting with the centrals and going back to the canines the normal condition is similar to that found in the permanent dentition and, speaking comparatively, the size and shape are also similar except that they have greater contour. The tip of the lower canine is exactly between the upper lateral and canine, whilst the distal edge of the cusp of the upper canine occludes with the mesio-buccal edge of the first lower molar ; and here the similarity ends because this mesio-buccal edge does not correspond to the mesial half of the tooth as it would in a premolar but only to a portion of the mesial half. The width of that part of the canine over-lapping the lower molar is about one-half the tooth, and this averages 3.3mm., and it only occludes with about one-third of the lower molar.

Now the molars have been reached there is no need to dilate upon the differences between them and their successors, the premolars. Both as regards shape and size, function and occlusion, premolars may be described as the typically omnivorous tooth, whereas the incisors and canines are of a carnivorous type, and the molars herbivorous. But compare these temporary molars with the permanent teeth of the same name.

That the permanent molars are both the analogue and homologue of the temporary molars there can be no doubt. Their function is similar, all being grinders and of the herbivorous type ; their form is similar in outline as regards the crown and often more or less in the arrangement of the cusps (this is true, more especially of the 2nd than of the first temporary molar), and their roots correspond almost exactly, save for the great divergence which is necessary for the developing premolars and, *finally*, the individual and total size of the lower molars is greater than that of the corresponding upper molars.

In this connection it may be mentioned that in a paper recently read in London by Mr. George Northcroft, the author stated that the combined width of the lower temporary molars is, on an average, 1.4 mm. greater than the combined width of the upper temporary molars. In the opinion of the present writer, those figures have not been exaggerated in the least ; in fact, he believes the average will be proved still greater—perhaps as much as 2 mm. and has examined cases where the difference has been as much as 4 mm. and 4.2 mm.

The effect of this difference is to bring the distal surfaces of the

last upper and lower molars on the same vertical plane or almost so ; owing to the great convexity of these surfaces it is difficult to say whether they are exactly so or whether the upper one is a little distal to the lower, but the similarity between the two dentitions in this respect is remarkable. (Fig. 1.)

As was said of the permanent dentition may now be said of the temporary :—“ The greatest efficiency and no waste of material,” and it will be recollected that this greatest efficiency is being considered in only one respect ; it is obtained in the same manner in both cases, *i.e.*, by the distal surfaces of the most distal teeth being in the same vertical plane in so far as convex surfaces may be spoken of in this way ; *i.e.*, each set of teeth is an organ complete in itself.

The anatomical facts essential to the subject of this paper having been enumerated, a closer consideration of the problem its title suggests will be proceeded with :—“ The Occlusion of the Temporary Teeth and its bearing on Class II.”

Here are two organs : one is to entirely replace the other, yet there must be no cessation of function. How does nature accomplish this ? By a connecting rod, if the phrase may be allowed, and this connecting rod is the four first permanent molars, and they alone because they do replace any of the deciduous teeth and should be erupted before any of them are lost. On the other hand, as soon as they are in place, other and greater changes immediately ensue.

The importance of these four teeth erupting and locking normally need not be further emphasised before this society. But what is of equal import is the question “ What is the probability of these permanent molars locking abnormally ? ”

It has been shown that, when all the temporary teeth are in place, the distal surfaces of the temporary molars are as near as can be in the same vertical plane, the lower being a shade mesial to the upper. From the figures already quoted and the fact that the average width of the distal half of temporary canines is 3.3 mm., the average distance of the distal surfaces of the second molars from one another is 1.9 mm. The writer believes that when more data has been obtained, it will actually be found to be less than this—little more than 1 mm.—but even these figures will serve the purpose of his argument. The four slides, Figs. 2, 3, 4, 5, show pictorially what it has been attempted to describe both in words, and figures, and it will be noted that the latter scarcely represent the condition in a pronounced enough manner. It is suggested Fig. 2 be taken as typically normal of the temporary dentition.

In Figs. 4 and 5, being the right and left sides of the same skull, there is normal occlusion of the temporary teeth, but in addition the first molars have erupted, but do not, and cannot occlude normally, while the temporary molars occupy the position shown ; the left side is the more distal of the two. Also observe the relation of the mesial surfaces of the permanent molars to one another in this skull and compare them with the mesial surfaces of the first



FIG. I.



FIG. IA.

TO ILLUSTRATE MR. CHAPMAN'S PAPER



FIG. 2.

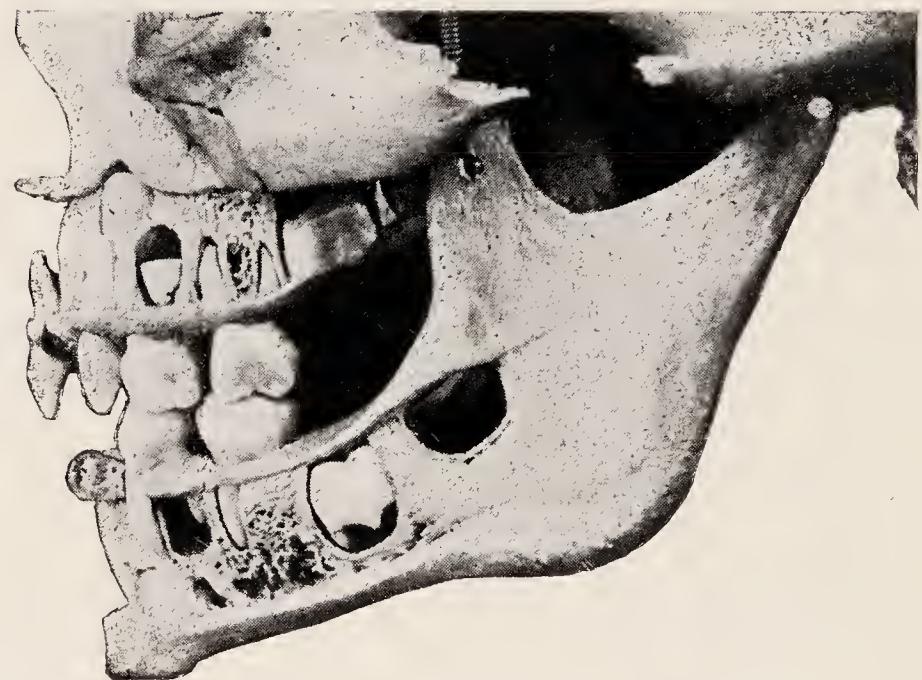


FIG. 3.

TO ILLUSTRATE MR. CHAPMAN'S PAPER.



FIG. 4.

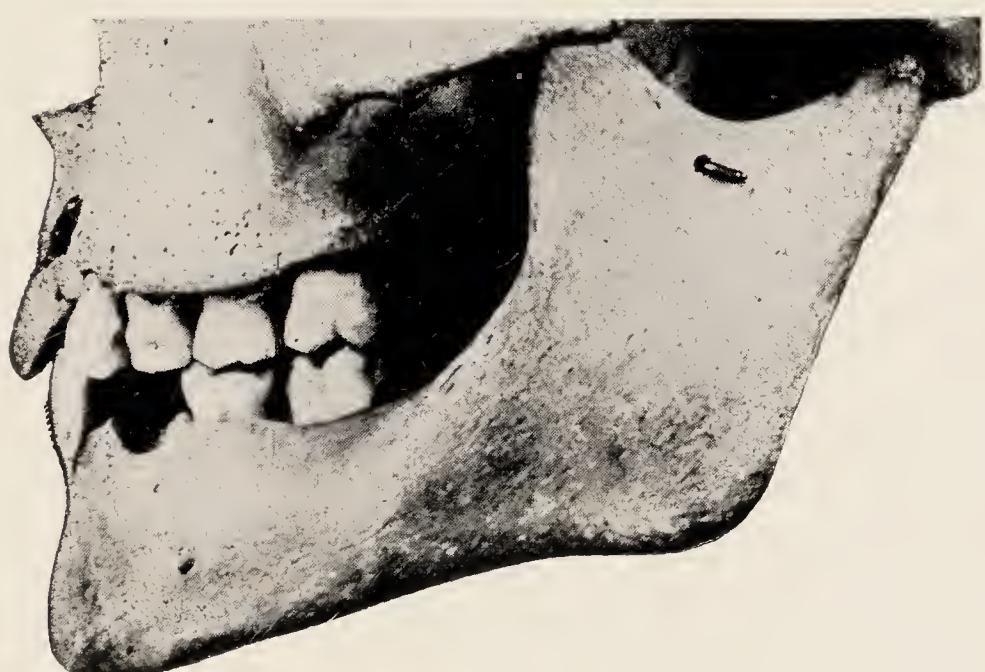


FIG. 5.

TO ILLUSTRATE MR. CHAPMAN'S PAPER

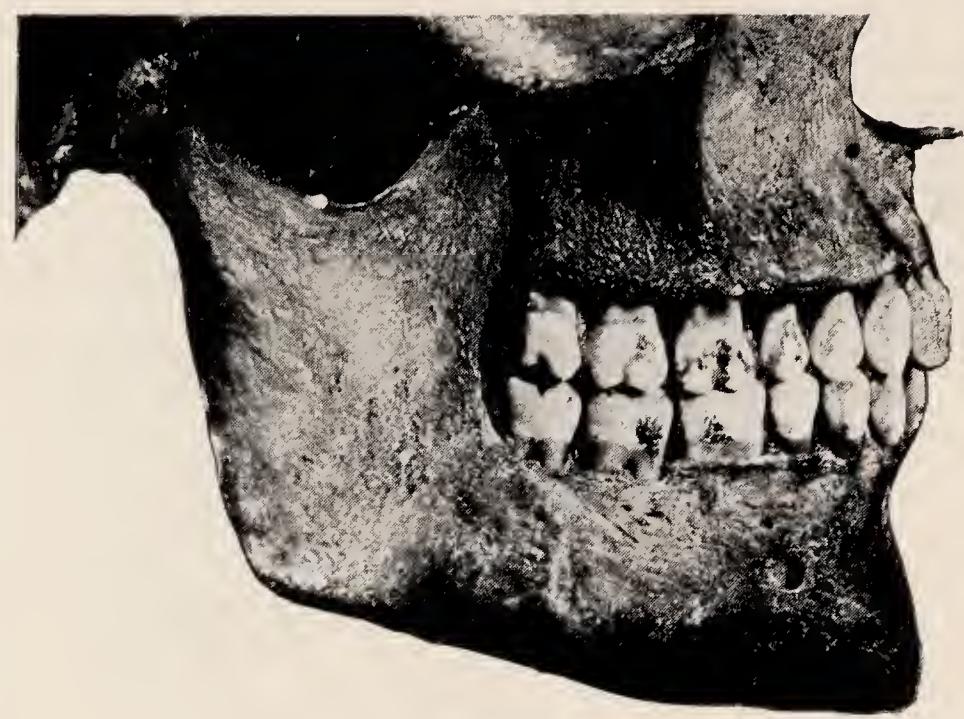


FIG. 6.

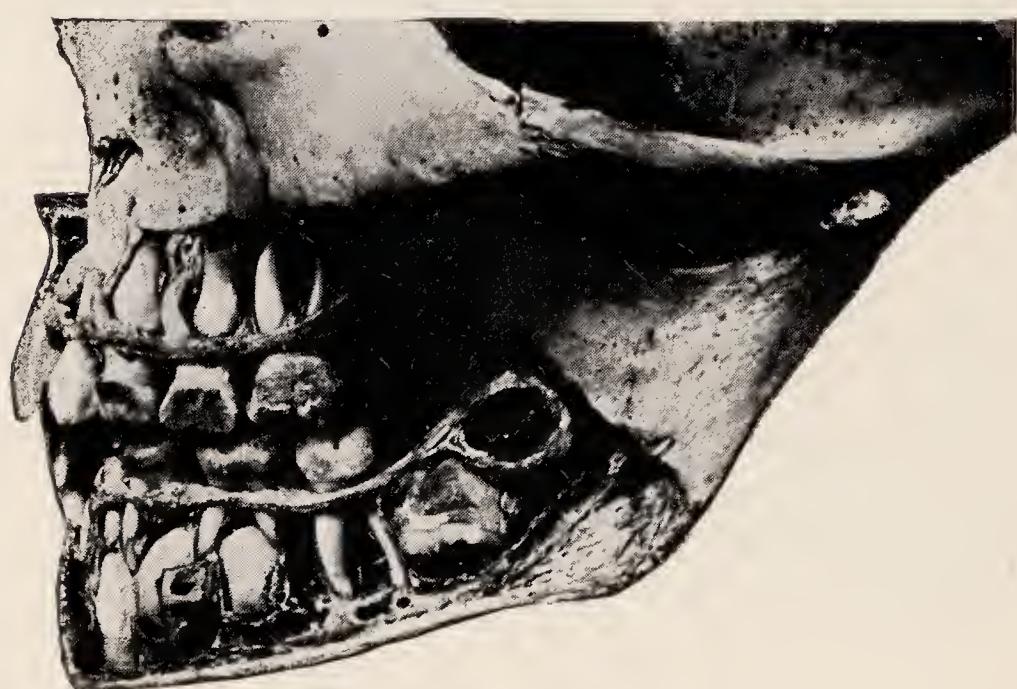


FIG. 7.

TO ILLUSTRATE MR. CHAPMAN'S PAPER

molars in Figs. 1 (taken from the skull of an Englishman) and 1A. Notice particularly how much the mesial surface of the permanent lower molar is in front of the same surface of the corresponding upper tooth and this is normal occlusion as found in adult skulls. Compare Fig. 6 with Figs. 1 and 5 it shows the teeth in distal occlusion, and yet the first permanent lower molar is more in advance of its fellow above than is the case in Fig. 5, which is typical of normal occlusion as far as the temporary teeth are concerned. But is it typical of the temporary teeth when the permanent molars are in position ? If this is so, the only compensating factor is that when the temporary molars are shed and replaced by premolars, the lower molar will have a greater distance to move forward because the pre-molars are all very nearly the same size and thus normal occlusion will be established. This answer confronts us with another question—why has this establishment of normal occlusion been delayed so long—till ten or eleven years—and in the meantime the danger of distal occlusion been ever present ?

But to return to the temporary molars at five years ; the distal surfaces of these teeth are in the same vertical plane as near as can be, the lower being a shade mesial to the upper. This difference is so slight that it is impossible for the first permanent molars to come into position and occlude normally unless some force—shall it be called development ?—is at work, impelling the lower jaw forward at a greater rate than the upper is moving. It is a well-known fact that some such force is a factor in the development of the jaws and in the production of normal occlusion and is well shown in Figs. 2 and 4. In Fig. 2, the second temporary molar is seen to occupy the same position in regard to the malar process that the first permanent molar ultimately does as shown in Fig. 4.

If this forward movement as regards the lower jaw is interfered with in any way, distal occlusion of the permanent dentition must result, and it must also result in the case of the very large lower molars mentioned above, though the extent of mal-occlusion may only be half a cusp or even less.

Dr. Angle, in the last edition of his book on mal-occlusion, defines Class II. thus : “ When from any cause the lower first molars lock distally to normal with the upper first molars on their eruption to the extent of more than one half the width of one cusp on each side.” Dr. Angle here seems to foreshadow the fact that perfect locking of the molars is impossible at the time of their eruption, but *ceteris paribus*, that they will be when the permanent denture is complete, when the pre-molars have erupted, and the developing second molar is pushing the first forward to fill the gap caused by the difference in size between the temporary molars and the pre-molars.

It will now be readily understood that if the lower jaw is at all disturbed in its development and is not moved forward at a rate equal to or even greater than the upper, the risk of distal occlusion occurring is very serious ; in fact, there is a great probability of their locking abnormally even though the milk dentition is normal. If any factors are at work causing the upper teeth, more especially the

first permanent molar, to move forward at too great a rate, for example, caries of the upper temporary molars on their approximal surfaces or even the loss of one of these teeth, distal occlusion must inevitably result, because the molars are not yet fully locked and a slight force in the wrong direction—forward in the upper and backward in the lower—will at this time allow the teeth to move and so permit them to lock abnormally.

Therefore, it is suggested that interstitial caries in the temporary teeth of the upper jaw should be treated at once by filling operations to restore or even over-restore, the normal contour, whilst those of the lower should be similarly treated, but without the same desire for excessive contour ; and finally it is suggested that the judicious extraction of the second lower temporary molar is at times desirable to prevent the development of a Class II. case, especially where these teeth are exceptionally large.

Fig. 7 shows a case of distal occlusion of the temporary teeth. There can be no doubt that the cause in this case is very different from the cause brought forward in this paper.

To sum up :—

1. Each dentition is an entity in itself, the molar series of each being, comparatively speaking, the same.

2. The connecting rod between the two dentitions is the first permanent molars.

3. If, on the eruption of the first permanent molars, the temporary dentition is the same as at three years of age, for example Fig. 2, then it is impossible for these teeth to lock normally at once, and there is a probability of their never doing so naturally unless the cusps are specially well developed as in the nervous temperament.

4. During growth the lower teeth move forward with the bone, the mental foramen considered as a fixed point, the upper teeth move through the bone, the molar process being a fixed point.

5. The causes working to produce a distal occlusion of the permanent teeth of the type just described are in no way the same as those producing a distal occlusion of the temporary teeth as shown in Fig. 7. It is possible that the former is acquired and the latter congenital.

6. Treatment to avoid distal occlusion of this type should be adopted as soon as a mal-occlusion is imminent.

7. It remains for practitioners interested in this study and work to decide upon a normal occlusion of the temporary teeth ; whether this normal condition is the same at three years as at eight years or whether it changes with the eruption of the first permanent molars or even later, and if so, how is the change accomplished ? To help in the accumulation of facts all should take models of their little patients at the earliest possible age and continue to do so at regular intervals, say six months, till the permanent denture is complete.

The writer fears his remarks are somewhat disjointed, but if some are urged to express to this meeting their views on, and others to study this question, he will feel they have not been in vain. His best thanks are due to Mr. Badcock and Mr. Northcroft for the use of models and to the Council of the Royal College of Surgeons of Eng-

land for permission to photograph the skulls from which the lantern slides have been made to illustrate this paper ; Fig. 1A has been reproduced from the American Text Book of Prosthetic Dentistry.

DISCUSSION ON MR. CHAPMAN'S PAPER.

Mr. GEORGE NORTHCROFT was sorry he had not had an opportunity of reading the paper before discussing it, but he congratulated the Author on the work he had done, and the excellence of his lantern slides. He was inclined to differ from him in considering the permanent and temporary dentitions as being separate entities ; he thought the temporary dentition and its occlusion controlled the permanent dentition a great deal more than the Author acknowledged. With regard to the distal surfaces of the second temporary molars, he thought that the normal temporary dentition should be not edge to edge, that the distal surfaces should not be in a vertical plane, but rather than the distal surface of the upper molar should overlap the distal surface of the lower molar. At that same time, even if Mr. Chapman was correct, according to Dr. Sim Wallace, the first permanent molars should erupt in normally developed jaws with a space in between their mesial surfaces and the distal surfaces of the temporary molars, and from observations he had lately made, he thought that that probably occurred normally in the upper jaw, but not in the lower jaw. That would allow the first permanent molar to come into normal occlusion at an earlier age than the Author admitted to be possible. The Author described the forward movement of the upper permanent molar, due to caries or the premature loss of a temporary molar, as distal occlusion, in this he was wrong. It was the upper molar that came into mesial occlusion, and it was necessary carefully to distinguish a case where the lower molar was really in distal occlusion and where the upper molar had moved forward and was the offender, and was in mesial occlusion.

Dr. SIM WALLACE said that at the first meeting of the Society, he tried to show why it was that the first permanent upper molar came into correct occlusion with its fellow below, and he had no particular reason for altering his view on that matter. There were three points he gave for thinking that the first upper molar came into proper occlusion with the first permanent lower molar. Firstly, whereas the lower molar erupted practically vertically, or even tilted slightly forward, the upper permanent molar had its crown directed downwards and backwards ; the upper molar came into position with a sort of rotatory motion, so that the cusps were slightly further back than they would be if the tooth came into position directly from above downwards. He believed with Mr. Northcroft that the second upper temporary molar ought to be slightly further back than the corresponding surface of the second lower temporary molar, and that the upper molar should come into position, having a slight space between it, and the second temporary molar. He had not meant it to be inferred that the first permanent lower molar came into position with a space between it and the second temporary molar, but that it actually erupted, touching it, slipping directly along the distal surface of the second lower temporary

molar. The third reason for the correct occlusion occurring immediately the permanent molars had fully erupted, was the fact that the inner or lingual cusp of the upper first molar was situated pretty far back, and came into a correspondingly depression near the middle of the lower permanent molar, and the occlusion was very largely regulated not by the outer cusps, but by the more pronounced inner cusp on the upper first permanent molar.

The PRESIDENT thought the Author and Mr. Northcroft had drawn attention to an important point, that so far as he knew had never been definitely settled ; what people mean when they speak of distal or mesial occlusion, whether they mean the relationship of the lower teeth to the upper teeth or the relationship of the lower jaw to the upper jaw. It seemed to him that a great deal of confusion arose for want of a more definite terminology. Mr. Northcroft pointed out a case where the upper molar, owing to the extraction of the temporary molar in front of it, moved forward, and said that was not to be called "distal occlusion," but "mesial occlusion of the upper molar," therein recognising that the tilting of the teeth had not in any way altered the relation of the jaws, but only the relation of those particular teeth. Mr. Chapman called attention in showing the last slide to the fact that the causation of the distal occlusion of the whole temporary set was quite different from the causation of distal occlusion of the permanent set, where this was owing to the failure of the lower molar to move forward into its proper place.

Mr. CHAPMAN, in reply, said that probably had he been present at the first meeting of the Society, when Dr. Sim Wallace read his paper, he should not have said some of the things he had that evening. With regard to Mr. Northcroft's remarks, taking first the question of separate entities, he began a paragraph in the paper by saying, "Admitting the correlation of the deciduous and permanent dentitions," and he thought that disposed of the point. He did not say right out there was no connection between them. There seemed to be no doubt that each dentition was a unit in itself, functioning separately for a considerable period of time. With regard to the overlapping of the distal surfaces, in order to emphasise that point, he admitted that the distal surface of the second upper temporary molar extended further back than the distal surface of the second lower temporary molar, but not to the extent it did when the permanent teeth were in position. The space between the vertical lines drawn along the distal surfaces of the upper and lower deciduous teeth was not nearly so great as it was when the bicuspids had erupted. With regard to the space between the mesial surface of the upper permanent molar and the distal surface of the second upper temporary molar, he should like to have an explanation why that took place in the upper jaw only, and that in the lower jaw they were in contact. Mr. Turner in the March number of the *Cosmos*, stated that the occlusal surfaces of the upper molars, as they were erupting, were directed downwards and backwards, and the lower ones forwards and upwards, not directly upwards as he had been described in the discussion. Which was right he was

unable to decide. He regretted he had confused the mesial occlusion of the upper permanent molar with distal occlusion of the lower teeth, but it was done only to avoid any further complications in the description. With regard to Mr. Badcock's remarks, in writing the paper, he had presumed that Angle's classification was accepted, and the definition of Class II. he had copied, word for word, from the latest edition of his book. Angle said that "when from any cause the lower first molars locked distally to normal with the upper first molars on their eruption to the extent of more than one half the width of one cusp on each side"—so that Angle did not recognise, as regards classification, the upper teeth being mesial to the lower at all. That was not on account of failure to admit that such a condition might exist, but on account of Angle taking the greater number of cases presenting themselves when formulating a classification rather than laying down an absolute law. As soon as he began to complicate his classification with such things it would be disregarded, as were all others ; it must be accepted as it is, and when exceptional cases were found, they must be described. For his own part he had always regarded distal occlusion to be a distal relationship of the lower jaw rather than a distal relationship of the teeth themselves.

The PRESIDENT having thanked Mr. Chapman for his paper, and those gentlemen who had taken part in the discussion, the meeting terminated.
